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Clinical Section

*Carcinoma of the Tongue

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Of all the painful deaths by which men leave this world there are few more miserable and agonizing than that which results from carcinoma of the tongue. From the beginning to the dreadful end one distressing feature follows another in rapid succession. Pain is followed by the unspeakably vile foetor of ulcerating infected carcinoma, by the dribbling of foul saliva, and then slow starvation day by day until the final climax is reached in a gush of blood or some equally terrible catastrophe. How gruesome and ghastly the finale witnessed by those who for months have stood by the miserable victim! Roughly 100 citizens of Manitoba have perished in this way during the last decade, according to the Provincial statistics.

The five year mortality of carcinoma of the tongue in the hands of the most expert surgeons is 70 to 80 per cent, and in the hands of the foremost radio-therapeutists it is only slightly less.[1] [2] The reasons for this high mortality are six in number.

(1) Thirty to sixty per cent of patients are in an advanced stage when first examined.

(2) The very rich lymphatic drainage favours early metastases.

(3) The almost constant muscular movements of the tongue results in active massage of the tumour, which has been proven experimentally to hasten dissemination of malignant cells.

(4) Early ulceration and infection are inevitable complications of carcinoma in this area, and they are known to favour early metastases. They also interfere with adequate radiation therapy, both because of the local changes and their constitutional effects.

(5) Carcinoma of the tongue is frequently a high grade, rapidly invasive type of tumour, with a marked tendency to mestasize.

(6) Many of these patients have for months or years had jagged and infected teeth with much attendent discomfort so that a little additional discomfort due to early carcinoma is ignored until the favorable period has passed.

The treatment of this disease is based, first, on an accurate knowledge of the normal and pathological anatomy of the tongue and its drainage areas; secondly, on a familiarity with the surgical methods of treatment that have been used and their results compared with the modern combination of radio-therapy and surgery, and its results.

Normal Anatomy

The tongue is divided, embryologically, anatomically, physologically, and to a certain extent, pathologically, into two portions, the anterior two-thirds and the posterior one-third. The two are separated by a V shaped line of circumvallate papillae.

The anterior two-thirds of the tongue is divided into two lateral halves by a firm fibrous septum through which there is practically no vascular anastomosis, and very scant lymphatic connections. Such a complete demarcation is the result of the fact that the anterior two-thirds are developed in the main from bilateral structures, namely, thickenings arising respectively from the right and left mandibular arches.[3] The posterior one-third is developed from the hyoid arch. There is no fibrous septum in the posterior one-third because this portion of the tongue develops from a thickening caused by the fused ventral extremities of the second arch. These facts are of considerable importance in the management of neoplasms of the tongue. The limited anastomosis of the anterior two-thirds means that one half of the tongue may be destroyed without fear of bleeding from the other side. In the posterior one-third haemorrhage from the other side is a certainty unless steps be taken to deal with the lingual arteries on both sides at the very beginning.

The histological anatomy of the mucosa of the tongue is very interesting when we recall that chronic irritation in one form or another is a definitely recognized factor responsible for the beginning of epidermoid carcinoma. The stratified squamous epithelium of the dorsum of the tongue is extremely variable in its structure. On the dorsum it is thrown into numerous papillae, fungiform filiform, coniform, circumvallate, and foliate. The surfaces of these papillae are protected from irritation by a cap formed of keratinized epithelium. While these papillae are essential in the manipulation of food in the mouth, and in the function of taste, they also provide myriads of recesses in which every chemical irritant entering the alimentary canal from exogenous and endogenous sources, inevitably lodges for a time. Here hot or irritant foods stagnate in millions of microscopic pools; here pus, bacteria, and their toxins from various intra-oral foci of infection find lodgement and dwell for a time, to trickle off the dome of the tongue over its less keratinized, and therefore, less protected edges. The edges and under surfaces are covered by a smooth thin squamous epithelium devoid of keratinized papillae. Even more important than the microscopic structure of the tongue mucosa is the mobility of the anterior two-thirds and its relation to jagged teeth and infected gums. It is on the surface and edges of the tongue that the great

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majority of epitheliomata occur. In the posterior one-third the lymphoid tissue, acting as a barrier at the entrance of the alimentary canal, soaks up like a sponge many infective agents, which would fain pass beyond it, and so is a constant site of bacterial and chemical irritation. The epithelium of the posterior one-third is smooth and contains few papillae. Deep to the epithelium are mucus glands with columnar mucus secreting cells, and ducts lined by cubical cells. From the cubical duct-cells may arise transitional celled carcinomata. The presence of a mucus secretion from the mucus glands is thought by some authors to explain the relative immunity of the posterior one-third to epidermoid carcinoma.

The Lymph Drainage of the Tongue

The entire tongue is provided with an exceedingly rich network of lymphatic vessels. When this fact is remembered, and also the almost constant muscular movements of the organ, one is not surprised that Stout records 66% of cases of carcinoma of the tongue as having neck metastases when they first seek medical advice.

The lymphatic vessels of the tongue are divided into three groups:

1. Anterior
2. Middle.
3. Posterior.

The **anterior** group drain the tip of the tongue to the submental groups of glands but some of the vessels may drain directly to the inferior deep cervical group situated anterior and posterior to the lower end of the internal jugular vein in the supra-clavicular region. This is a point of no little importance. Carcinoma of the tip of the tongue may metastasize directly to this group of glands before affecting any of the adjacent groups and unless such involvement is anticipated it might readily be over-looked.

The **middle** group receive communications from the anterior group and drain to the submaxillary and upper deep cervical group, both medial and lateral to the internal jugular vein.

The **posterior** group receive no communications from the middle or anterior group. It drains into the upper deep cervical glands on both sides of the neck. The latter fact is noteworthy in all carcinomas of the posterior ⅓ of the tongue. From the very beginning of such a lesion, even if it is unilateral, both sides of the neck are in danger.

Pathological Anatomy and Histology

The presence of carcinoma of the tongue is associated so constantly and so definitely with certain chronic irritants as to leave no doubt as to the importance of chronic irritation as an aetiological factor. From 20 to 85 per cent of various series of such patients have either active syphilis or a history of the disease.[4] A positive Wassermann should increase one's suspicion of carcinoma in a given case of tumour of the tongue. Ninety per cent of the patients are smokers. Over 50 per cent have infected gums and teeth, the latter frequently have jagged and sharp edges. A striking illustration of this occurred two years ago in my own practice in a patient with an epithelioma of the tip of the tongue. He had a mouth full of infected teeth; one of the lower incisors had for years been rotated on its long axis and tilted towards the tip of the tongue so that its sharp corner caught the tip of the tongue in the very centre of the area in which the tumour was situated.

Thirty per cent of patients have leukoplakia, which in turn is probably often produced by one or more of the above chronic irritants. Chronic glossitis, fissures, and ulcers due to whatever aetiology should always be regarded as pre-malignant lesions.

Fraser, of Edinburgh, in a large series of cases gives the following distribution of tongue carcinomas:—

Edge	43%
Tonsillar region	20%
Sublingual	10%
Edge to Alveolus	11%
Dorsum, Posterior, Tip	16%

The commonest type of lesion is an infiltrating type. Sooner or later it becomes excavated in its middle, leaving raised edges and a much wider and deeper area of infiltration than appears on first examination. The extent of the tumour is usually much better determined by palpation than by inspection. Such a lesion may be of any grade, but generally the tendency in tongue lesions is to be of a higher grade than in those of the lip. Grade two or three lesions of the anterior two-thirds are much commoner than grade 1 lesions. In our small series of ten cases there were no grade 1 tumours. One was grade 4, five were grade 3, three grade 2, and one was not graded.

Fungating or polypoid lesions of the tongue are comparatively rare. They infiltrate slowly, are of a lower grade, and metastasize later than the infiltrating variety. They are generally radio-resistant. An extensive flat tumour sometimes with multiple foci of origin, is the type that not infrequently follows leukoplakia. It ulcerates late and metastasizes slowly. This type of tumour is always radio-resistant.

Tumours of the posterior one-third of the tongue constitute only 1 to 2 per cent of tongue carcinoma. The majority of them are very highly malignant tumours. They are of four different varieties. Epidermoid carcinoma, similar to the varieties encountered in the anterior two-thirds constitutes the most frequent tumour of this region. Less common varieties of tumours in this situation are the lympho-epitheliomas[5 6 7] or transitional cell carcinomas, and occasionally adeno-carcinoma arising from mucus glands. The former two are highly malignant, rapidly metastasizing, but very radio-sensitive. It is very often an extremely difficult matter to decide whether these tumours

are lympho-sarcomata or epitheliomata of the anaplastic or transitional-celled or lympho-epitheliomatous type. No one feature is decisive, the clinical course, the local condition, response to radiation, and microscopic picture must all be considered. Adeno-carcinoma is moderately malignant, and moderately radio-sensitive. It generally metastasizes late. The local tumours are bulky, fungating masses. In a series of 200 cases of tumours of the tonsils and base of the tongue Ewing[5] records the following varieities.

Squamous epithelioma	72%
Transitional cell carcinoma	12%
Lympho-epithelioma	4%
Lympho-sarcoma	9%
Unclassified	3%

Metastases

Early metastases from all tongue tumours are favoured by the rich lymphatic drainage and by the constant muscular activity of the tongue. Deep ulceration and infective complications are known to accelerate the spread of any tumour, and these factors are inevitable early complications in lesions affecting the tongue. Fnally, many tumours of this organ belong to highly malignant classes of tumour, which characteristically spread to lymph nodes at an early period. It is not to be wondered, therefore, that 30 to 66 per cent of patients with tongue carcinoma have lymph node involvement when first they seek treatment. In the Winnipeg cases recorded by Dr. Nicholson for the Cancer Institute, 60% of cases have glands at first examination. The extent of the involvement depends on the duration of the disease and also the other factors mentioned, notably, the malignancy of the tumour and the presence of ulceration and infection. The areas involved depend on the anatomical arrangements previously referred to. It should be pointed out that the normal anatomical paths are followed only at the onset; when lympth paths become blocked by tumour cells or by inflammatory reaction, devious routes may be followed and glands may be found to be involved in unexpected situations.

It is now generally accepted that spread of Buccal carcinoma is by lymph embolism and not by permeation of lymphatics. Radiation therapy more than any other influence has made possible this deduction. If interstitial radiation of a primary tumour of the tongue, followed by block dissection of the neck is successful in producing a fair percentage of cures, it is obvious that lymphatic permeation could not be the chief method of spread, otherwise the tissue between the primary tumour, and the dissected area, would be the site of frequent recurrences. Actually, recurrences on the floor of the mouth are uncommon if the primary lesion is adequately dealt with.

Surgical Treatment of Carcinoma of the Tongue

The immediate mortality is 6 to 14 per cent in the surgical treatment of cancer of the tongue, which is a formidable figure to contemplate. If this were followed by a high percentage of cures the seriousness of the disease would justify the risk. However, the five-year cure of cancer of the tongue was 22.8 per cent in the hands of a master like Kocher, and 23 to 32 per cent in the hands of Butlin.[1] While an accurate comparison of cases is not possible, Berven of Stockholm[2] reports 32 per cent of five-year cures by radiation therapy in all cases of carcinoma of the tongue. This equals the best that Butlin could do, and probably includes cases that he would not have accepted. When the better functional result that is afforded by radiation compared with surgery is considered, one has no doubt as to the superiority of the former in the management of carcinoma in this situation.

Twenty years ago the operations devised by Whitehead, Kocher, Syme and Trotter for carcinoma of the tongue were regarded in the realm of surgery as important achievements approaching the ultimate in eradication of this disease. Even as late as 1927 Rowlands and Turner make this comment regarding radiation therapy of carcinoma of the tongue:—

> "A word of warning may be given here with regard to the use of x-rays of radium in the early stages of this disease. An epithelioma of the tongue will not be cured by these means and much precious time may easily be wasted."

The mutilating procedures devised and carried out by the surgeons of the early 20th century may still have their place in certain selected cases, but the present indications for surgery, learned by years of experience with radiation therapy, are much more limited than they were in the day of Kocher and Butlin.

While there is no final unanimity with reference to these indications the following lesions would generally be accepted as suitable for surgical removal:—

1. Small tumours of low grade.
2. Large, low-grade lesions limited to the anterior two-thirds of the tongue or adjacent floor of the mouth.
3. All tumours involving bone if not too extensive, and if, as will rarely be the case, there are no other contra-indications to surgery.
4. Surgical or diathermy excision is often called for in tumours arising in a syphilitic tongue, because the scarred organ has a vascular bed unsuitable for a satisfactory radiation reaction.
5. Surgical removal as an adjunct to radiation.

Generally, at the present time, surgical excision as an adjunct to radiation implies the use of the diathermy or the actual cautery to remove a bulky lesion either before or after adequate radiation. The diathermy knife enjoys a wide popularity in the modern surgery of carcinoma of the tongue.[8] The minimum of manipulation is required, there-

fore, the likelihood of disturbing the tumour and causing metastases during the operation is remote. If the minimum effective current be used without sparking not over a millimeter of normal tissue is destroyed in the remaining portion of the tongue. Haemorrhage is minimal and easily controlled with the coagulating current if the lingual or external carotid has been tied as a preliminary measure. Ligation of the external carotid is to be preferred to ligation of the lingual if the tumour extends back toward the posterior one-third, especially if it invades the pillars of the fauces or the tonsil, because these areas are supplied by vessels other than the lingual, notably, the ascending pharyngeal, ascending palatine, and the tonsillar branch of the facial.

Surgical measures for dealing with operable neck metastases have been thoroughly and scientifically devised by Butlin and by Crile. There is no need of going into the technique of these proceedures. The technique is standard and universally accepted, but there are wide differences of opinion with regard to the indications for neck dissection.

[2]Berven of Stockholm radiates all necks by means of a radium bomb. If nodes do not disappear or if they become palpable under treatment a radical neck dissection is done and radium needles introduced at the same time. Birkett[9] of Manchester, if he palpates no glands, gives no treatment, but keeps the patient under observation at monthly intervals. If glands appear, he does a block dissection and implants needles in areas in which rapid section shows malignant involvement. Quick[10] of New York does a block dissection in low-grade cases when glands become palpable, and in higher-grades exposes the glands under local anaesthesia so that gold seeds may be implanted in them. Martin of New York follows the lead of Quick with increasing tendency to get away from block dissections.

Perhaps the most conclusive argument for conservatism in the management of neck nodes is that advanced by Duffy.[11] In a group of 27 cases with in-operable neck nodes 14.4 per cent of five-year cures was obtained by a combination of external radiation and interstitial implantation of seeds after surgical exposure of the involved glands. He does not mention the surgical cure rate in the operable group, but says it is no better than the surgico-radiological cure rate in the inoperable group. Bloodgood's five-year survivals in cases of carcinoma of the tongue after radical neck dissection is only 10 per cent.[12] Presumably since these were operable they were all earlier cases than Duffy's and should, therefore, if the two methods of treatment had equal value, have yielded a distinctly higher percentage of cures.

More important still in the argument for conservative management of the glands is the fact that of 123 cases presenting themselves without metastases, in whom the primary lesion was eradicated, only 23 per cent subsequently developed metastases. To have done radical neck dissections or prophylactic radiation on this group of patients would have meant 77 per cent of wasted effort with the useless risk and discomfort it would entail.

It is universally agreed that where glands are fixed, where they are very extensive, especially if back of the mastoid process on both sides of the neck, or on the side opposite the lesion, they should be regarded as inoperable and treated palliatively be external radiation. Most surgeons agree also that glands metastic to grade 3 or 4 carcinoma, or transitional-cell carcinoma, are inoperable.

Radiation Therapy

During the past 50 years a quiet revolution has been taking place in the treatment of malignant disease, no where better exemplified than in carcinoma of the tongue. It has gradually come to be recognized largely as a result of radiation therapy that carcinoma of the tongue is not one disease but a group of diseases and that a method of attack which would be highly successful for one would be a complete failure with another. For example, surgical failures with cancer of the posterior one-third of the tongue used to be explained on the basis of the tumour's inaccessibility. They are now known to be due to the rapid growth, deep infiltration, and early bilateral metastases which charcterize these tumours. Fortunately, the radio-sensitivity of this group makes it eminently suitable for radiation therapy, though, unfortunately, very early spread takes place and even if the primary lesion be dealt with satisfactorily, and the gland-bearing areas radiated aggressively, almost 100 per cent of these unfortunate patients die of distant metastases in the mediastinum, lungs, or more remote situations. Conversely, carcinoma of the anterior two-thirds may be low-grade, and, therefore, highly radio-resistant. While such a tumour can be destroyed by a caustic dose of radiation, the results of surgical removal are so good as to make this method of therapy the preferable one.

Radiation therapy, then, is indicated in:—

1. All high-grade tumours (2, 3 and 4). Generally speaking carcinoma of the tongue is radio-sensitive to a greater degree than the grade would indicate.
2. All tumours of the posterior one-third of the tongue.
3. As a preliminary, or an adjunct to surgery, where the tumour is a large infiltrating or fungating one.

In the latter group of cases Quick[10] uses the tumour as an applicator and radiates it heavily, removing the whole irradicated mass before the radiation reaction begins. Berven removes the bulk of the tumour and radiates only the tumour bed. Good results follow both methods, but there seem to be sound reasons which make the latter method preferable. It requires less radium, it produces less reaction in normal tissues, and less marked constitutional effects. The radiation used is con-

centrated at the advancing base of the tumour where it is most needed.

The technique of radiation varies considerably and need not be discussed in detail. Preliminary x-radiation or telicuric therapy is advocated by Berven[2] followed by interstitial implantation of needles. Quick and Martin[10] use interstitial seeds on lesions of the anterior ⅔ of the tongue, and Coutard deep x-ray therapy to the posterior ⅓. Cutler employs telicuric therapy, interstitial needles, but also treats selected cases in the middle region of the tongue by means of surface plaques, screened laterally so as to protect the alveolus.

All these authors emphasize the necessity of minimizing the trauma to the tumour during the implantation of needles or seeds. Gentil of Lisbon goes a step further than the others in lessening trauma by making a track for the needles by means of a diathermy bistoury.

Lesions of the posterior one-third can generally be satisfactorily implanted with seeds or needles from the suprahyoid region in the neck. With one finger in the mouth on the tumour the needle can be guided accurately into place from below. Implantation from the oral surface of such lesions is very difficult and uncertain, and unnecessarily carries infection into the tumour.

One of the most important advances in radium therapy in the last ten years is that which resulted from the work of Martin and Quimby.[13, 14, 15] It is important in thinking about radiation to think of it in terms of its effect on the tumour rather than the amount of radium introduced, or the time it is left in situ. Granted that there is no entirely satisfactory method of expressing radiation dosage, the most satisfactory method, to date, of expressing radiation dosage in terms of its effect on a tumour is the skin erythema dose. By working out the dosage of radiation given to a group of cured intra-oral cases and expressing it in skin erythemas, they showed that 7 to 10 skin erythemas are required to destroy an epidermoid carcinoma. Knowing the dimension of a given epidermoid carcinoma of the tongue, it is possible, therefore, with the aid of the table compiled by those workers to calculate accurately the amount of radiation required for that lesion. The authors admit there is room for an error of 10 per cent in the calculation of such a dose, and also there are possibilities of error in the implantation of seeds or needles. There are even wider percentages of error in the sensitivity of various tumours, but the dose of 10 S.E.D. is calculated for the lower grades. More sensitive tumours would be destroyed by less radiation than the maximum. Thus is the treatment of this disease put on a mathematical basis, or at least as near to a mathematical basis as one can approach with such a problem, remembering that cancer of the tongue is not one but a group of diseases, and that the response to radiation is as variable as the cellular structures of the different carcinoma groups occurring in this organ.

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Special Articles and Association Notes

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There has been a definite increase during the last few years in the number of journals and books borowed from the Medical Library by practitioners outside of Winnipeg. But there are still many practitioners who have not made use of the library service.

All books, except reference books, and all journals, except the current numbers, will be sent out to any registered medical practitioner on request. All that is required is to mail the request to the Librarian, Medical Library, Medical College, Winnipeg, and the publication will be sent. The practitioner is required to pay the postage one way only. The remainder of the expense of the distribution is paid for by a grant from The College of Physicians and Surgeons of Manitoba.

Each month there is a list of the principal articles in some of the more commonly used journals published in the *Review*. This does not by any means exhaust the number of journals available to practitioners. There is also published each year a list of recent accessions to the library.

Medical practitioners throughout the Province are urged to make greater use of this very valuable library service.

THE MEDICAL SCHOOL —A GLIMPSE OF THE PAST

On November 22nd, in Chicago, Mrs. A. H. Ferguson died at the age of eighty-seven. Her death forges the last link in a chain of memories.

Although Dr. and Mrs. Ferguson left Winnipeg to settle in Chicago in 1894, there will be some of the older practitioners who knew them intimately, many who were acquainted with the doctor, and still more who have heard of his fame as a surgeon. Born in 1853 in Ontario, Alexander Hugh Ferguson came with his parents as a boy to Winnipeg, attended Manitoba College, Toronto University and Trinity Medical College. After post-graduate work in New York, Glasgow, London and Berlin, where he received a diploma for his work in bacteriology, then a new science, he returned to Winnipeg and began practice in 1882. Next year he was one of a group of thirteen who founded the Manitoba Medical College. In 1886 he became Professor of Surgery. For a time he was on the Attending Staff of the Winnipeg General Hospital, but, after a quarrel, he resigned and transferred his services to St. Boniface Hospital.

Trained in the then new Listerian principles, Ferguson soon obtained considerable reputation as a surgeon. In accordance with the fashion of the time, a surgical theatre with an amphitheatre seating eighty or more was constructed in St. Boniface Hospital. Further, in order to give the medical students opportunity to be present at his clinics, Dr. Ferguson had a van drawn by four white horses call at the Medical College on the appointed days. Into this van the students would pile, the driver's whip would crack, and off the horses would trot to the accompaniment of rousing choruses, the favorite being "Maggie Murphy's Home." At this time there was a toll bridge at the foot of Broadway. The students being usually impecunious, would drive across the ice when it would bear them, but on other occasions is was necessary to cross by the bridge. Then would ensue altercations with the Irish Horatius, and one time he was inveigled into the van and carried as far as Main Street before being released.

It is over forty years since Dr. Ferguson moved from Winnipeg. The old amphitheatre has long disappeared, gone are the van and the four white horses, Broadway Bridge has ceased to exist, no longer do the streets of Winnipeg re-echo to the strains of "Maggie Murphy's Home." Now the medical students are seen but seldom heard, surgeons stand less in the full blaze of the limelight, and possibly are less temperamental. There is more science in the Medical School now, but is there as much colour? —R. B. M.

Department of Health and Public Welfare

NEWS ITEMS

IMPORTANT FACTORS IN THE CONTROL OF VENEREAL DISEASES: The following is the final instalment of an article appearing under "News Items" in the "Review" by Lida J. Usilton and J. R. Heller, Jr.

STANDARD TREATMENT PROCEDURES

Early Syphilis

The United States Public Health Service, having shown the minimum prevalence of syphilis and gonorrhea in the United States, joined with the Health Organization of the League of Nations in the evaluation of the pooled records of cases of syphilis. The purpose of this study was to obtain significant data regarding the suppression of communicable relapse and the protection of the patient from the severe late effects of the disease. As a result of these statistical evaluations the Committee of Experts on Syphilis and Cognate Subjects recommended two methods of treating primary syphilis and early and late secondary syphilis as being the most successful at the present time—the continuous method of treatment carried out more commonly in the United States and the intermittent method used with much success in Denmark and Great Britain. The details of these schemes of treatment have been reported and those for the continuous scheme of treatment are available for distribution by the Public Health Service.

A further analysis of the American material was made, by the Cooperative Clinical Group, of the cases of early syphilis which were followed for a period of two years or longer as distinguished from the larger material studied in which the patients were observed for six months or longer.[6]

It is believed that nothing can be more helpful in the task of holding a patient under treatment than to be able to speak to him in definite terms as to the possible outcome of his infection. From the physician's standpoint nothing can be more helpful than to elminate the always present uncertainty as to when treatment should be discontinued. There is still an element of speculation with regard to the ultimate outcome of syphilis, for the second decade since the beginning of the arsphenamine era has scarcely been reached. Available evidence indicates that many of the late disabling manifestations resulting from syphilis occur after this period. However, the results of present day methods of treatment of syphilis are sufficiently encouraging up to the 20-year period to enable the physician to talk in much more decisive terms and with much more confidence than he has been able to do in the past. Some of these facts are presented for the use of the physician in holding his patient: (a) The promise of 80 per cent "cure" from continuous treatment begun in the early stages and maintained until after the patient has received a minimum of twenty, but preferably more than thirty, injections of arsphenamine with appropriate heavy metal. (b) The possibility of permitting rest periods after courses of arsphenamine when the patient begins treatment in the seropositive primary stage. (c) The frequency of infectious relapse in the first two years of the disease as a result of irregular, inadequate treatment. (d) The fact that the serologic blood test has no value as proof of infectiousness or non-infectiousness in either early or late syphilis. (e) The importance and significance of a negative spinal fluid examination for the early syphilitic on termination of treatment. (f) The possibility of discontinuing treatment of the individual whose early syphilis has had an uneventful course and who has received at least twenty, but preferably more than thirty, injections of arsphenamine with interim heavy metal, although it is well to keep such patients under observation for at least one year following the discontinuance of treatment. (g) That there is no deadline drawn at two years for the early syphilitic with an "unsatisfactory outcome" who has received an inadequate amount of treatment within that period. In such cases additional treatment in the form of ten or more injections of arsphenamine with interim heavy metal ultimately succeeded in rendering 33 per cent of the cases studied by the Cooperative Clinical Group, symptom free and serologically negative.

Latent Syphilis

The incidence studies by the U. S. Public Health Service indicated that one-half of the syphilitics seek treatment for the first time after the disease has reached the late or latent stages. In fact, in most of the clinics of the country the latent cases far outnumber the early or late syphilitics. Very often overcrowding of the clinic results from failure to determine the end-point of treatment. Diagnosis of latent syphilis may be made either on the basis of serologic tests of the blood or, more rarely, on the basis of history (as, for example, in the Wassermann negative mother of a congenitally syphilitic child). For an individual with a positive Wassermann reaction and no clinical manifestations of syphilis an examination of the spinal fluid is of paramount importance in determining subsequent treatment. If the spinal fluid is negative it is a practical guaranty against the development of neurosyphilis (except the vascular type), whereas, if the spinal fluid is positive and the patient has asymptomatic neurosyphilis the prognosis is much graver than it is in latent syphilis and the case requires different treatment. The Cooperative Clinical Group[7] reports that (a) it should not be construed that the latent syphilitic with a negative spinal fluid should not be given treatment; (b) treatment increases the probability of "cure" or "arrest" and decreases the probability of progression or relapse as compared with the probable results if no treatment is given; (c) by means of treatment the ultimate satisfactory clinical outcome in a latent syphilitic may be obtained in 85 per cent of the patients in contrast to 35 per cent if no treatment is given; (d) the probability of the birth of a living, healthy child to women with latent syphilis is increased with only 17 per cent in women who are not treated to 65 per cent or better in those who are treated; (e) in early latency (where infection is of less than four years' duration) continuous treatment is almost as essential as in early syphilis. In late latency (duration of infection more than four years) this type of therapy is no longer so important and rest periods probably do no harm; (f) maximum results are obtained with about twenty injections of arsphenamine combined with large amounts of heavy metal, the administration of the latter over long periods of time.

Prevention of Prenatal Transmission of Syphilis

It is estimated that there are at any one time approximately 186,000 potential mothers in the United States who have syphilis. Stillbirths occur four times more frequently among women with syphilis than among non-syphilitic women. In addition to these stillbirths a high percentage of infants born of syphilitic mothers are handicapped throughout life. It is the duty of every physician to take measures to detect syphilis in the expectant mother and see that she is treated throughout her pregnancy. The Cooperative Clinical Group has shown that the prenatal transmission of syphilis can be prevented in a very large proportion of cases by insistence on the following principles: (a) performance of blood serologic tests on every pregnant woman as early as possible and more than once in the course of her pregnancy; (b) the institution

of effective treatment for syphilis before the fifth month of pregnancy and in any event as long as possible before its termination; (c) the use of both arsphenamine and heavy metal, but in any case at least arsphenamine, in the treatment of pregnant syphilitic women; (d) a minimum, if time permits, of four grams of old arsphenamine ("606") or its equivalent in twelve to fifteen weekly injections plus at least six injections of bismuth; (e) continuous treatment up to, and especially near the termination of pregnancy; (f) the exercise of special caution in preliminary examination, this caution, however, not to be carried so far as to lead to timidity in carrying through a prenatal treatment regime; and (g) the maintenance of adequate and prolonged serological follow-up of children born of treated syphilitic mothers.

With the detection of syphilis in the pregnant woman and the institution of early and adequate treatment, promise of a living, non-syphilitic infant can be given in a very high percentage of cases. In the Cooperative Clinical Group study this was found to be 91 per cent of the cases so treated.

Summary

1. There are constantly under treatment in the United States 493,000 cases of gonorrhea and 683,000 cases of syphilis.

2. The peak infection period is between the ages of 16 and 35 years.

3. Only 16 per cent of the early syphilitic patients seeking treatment continue until they have been adequately treated.

4. Two-thirds of the patients under treatment for venereal diseases are being treated by the private practitioner.

5. The primary duty of the private physician is to transmit sufficient information to the patient with early syphilis to be sure that he understands the importance of remaining under treatment until he has received the maximum benefit of antisyphilitic treatment.

6. Descriptions of standard treatment procedures for early syphilis, latent syphilis, and syphilis in pregnancy have been prepared by the Cooperative Clinical Group and are available from the United States Public Health Service.

REFERENCES

(1) U. S. Surgeon General's Office. Defects Found in Drafted Men. Statistical information compiled from the draft records. Washington, U. S. Government Printing Office, 1920, p. 105.

(2) Usilton, L. J. Ven. Dis. Inform., Washington, 1935, 16: 147-164.

(3) Information from the files of the American Social Hygiene Association, New York. (Personal communication).

(4) Cole, H. N. et al. Ven. Dis. Inform., Washington, 1934, 15: 83-107.

(5) Bruusgaard, E. Arch. f. Dermat. u. Syph., Berlin, 1929, 157: 309.

(6) Stokes, J. H., et al. Ven. Dis. Inform., Washington, 1934, 15: 341-363.

(7) Moore, J. E., et al. Ven. Dis. Inform., Washington, 1932, 13: 317-331, 351-364, 371-379, 389-401, 407-412; 1933, 14: 1-12.

"STAMP OUT SYPHILIS"

"Stamp Out Syphilis" is the title of a recent article by Dr. Thomas A. Parren, Jr., Surgeon General of the U. S. Public Health Service. Copies of this article, which appeared in Survey Graphic and was reprinted in part in Readers Digest, may be secured from the Bureau of Venereal Disease Control, New Jersey State Department of Health, Trenton, N. J.

The following is a table showing conditions in Manitoba as reported to the Department of Health and Public Welfare for the years 1925-1935 inclusive:—

GONORRHOEA

ADULTS	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935
Male	1,164	1,173	1,207	1,282	1,044	1,184	1,015	760	883	916	861
Female	189	228	282	311	304	438	313	257	242	208	201
CHILDREN (0-12 Years)											
Male	4	3	7	3	2	3	2	5	3	1	0
Female	18	29	34	18	20	25	88	29	24	22	13
Total	1,375	1,433	1,530	1,614	1,370	1,650	1,418	1,051	1,152	1,147	1,075

SYPHILIS

ADULTS											
Male	353	453	439	523	387	357	393	367	228	281	198
Female	130	184	180	229	190	190	199	202	136	179	152
CHILDREN (0-12 Years)											
Male	2	6	8	5	6	4	16	14	15	7	10
Female	7	4	5	8	11	4	15	12	15	8	11
Total	492	647	632	765	594	555	623	595	394	475	371

COMMUNICABLE DISEASES REPORTED

Urban and Rural - November, 1936.

Occurring in the Municipalities of:

Scarlet Fever: Total 313—Winnipeg 171, Kildonan West 22, St. James 18, Unorganized 14, Hanover 8, Louise 7, Transcona 7, Carman 6, St. Boniface 6, Gilbert Plains Village 5, Bifrost 5, Grandview Town 4, Kildonan East 4, Rockwood 4, Gilbert Plains Rural 3, McDonald 3, Springfield 3, St. Anne 3, Brooklands 2, Flin Flon 2, Grandview Rural 2, Lansdowne 2, Ethelbert 1, Gladstone Town 1, Killarney 1, Manitou Town 1, Portage City 1, Rhineland 1, Rivers 1, Roblin Rural 1, Roblin Town 1, Swan River 1, St. Vital 1, Tuxedo 1, Woodlands 1.

Chicken Pox: Total 303—Winnipeg 193, St. Boniface 46, Kildonan West 18, Brooklands 7, Unorganized 7, Brandon 6, Blanchard 5, Flin Flon 3, Norfolk South 3, The Pas 3, Westbourne 3, Hamiota Rural 2, Stonewall 2, Fort Garry 1, Lac du Bonnet 1, St. James 1, St. Vital 1 (Late Reported: October, Roland 1).

Measles: Total 113—Unorganized 39, Virden 22, Rockwood 12, Winnipeg 6, Eriksdale 5, Archie 3, Wallace 3, Grandview Town 2, Hanover 2, Kildonan East 2, Neepawa 2, St. Boniface 2, Blanchard 1, Carman 1, Hamiota Rural 1, Lakeview 1, Rosser 1, Stonewall 1, St. Vital 1, The Pas 1, Whitemouth 1 (Late Reported: August, Unorganized 1; September, Springfield 1).

Whooping Cough: Total 52—St. Clements 37, St. Paul East 11, Unorganized 4.

Tuberculosis: Total 47—Winnipeg 10, St. Boniface 3, Unorganized 3, Morris Rural 2, The Pas 2, Bifrost 1, Bolton 1, Carman 1, Dauphin 1, Ellice 1, Dufferin 1, Fort Garry 1, Portage City 1, Gilbert Plains 1, Glenella 1, Hamiota Town 1, La Broquerie 1, Lorne 1, Miniota 1, Minitonas 1, Morton 1, McCreary 1, Norfolk North 1, Portage Rural 1, Rockwood 1, Shell River 1, Strathcona 1, Swan River 1, St. Anne 1, St. Francois Xavier 1, St. Vital 1, Woodlea 1.

Anterior Poliomyelitis: Total 37—Winnipeg 7, Brandon 2, Portage Rural 2, Rosedale 2, Binscarth 1, Cypress North 1, Fort Garry 1, Kildonan East 1, Montcalm 1, Morris Rural 1, Portage City 1, St. Boniface 1, Whitemouth 1, Woodworth 1 (Late Reported: August, St. Andrews 4; September, Brandon 1, Elton 1, Rosedale 1; October, Rosedale 3, St. Boniface 1, Unorganized 1, Brandon 1, Ellice 1).

German Measles: Total 28—Unorganized 28.

Mumps: Total 24—Winnipeg 6, Selkirk 5, McDonald 3, Brandon 2, Roblin Rural 2, Kildonan West 1, Norfolk North 1, St. Boniface 1, St. Vital 1, Unorganized 1, Westbourne 1.

Diphtheria: Total 14—Winnipeg 4, St. Boniface 2, Gimli Rural 1, Gimli Town 1, St. Clements 1, The Pas 1, Transcona 1 (Late Reported: October, Eriksdale 1, St. Boniface 1, Unorganized 1).

Erysipelas: Total 9—Winnipeg 5, Beausejour 1, Morris Rural 1, Strathclair 1, St. James 1.

Typhoid Fever: Total 9—Stanley 4, St. Clements 1, Rhineland 1 (Late Reported: August, Shellmouth 1; September, Westbourne 1; October, Morris Rural 1).

Influenza: Total 5—Winnipeg 1 (Late Reported: August, Bifrost 1, North Norfolk 1; September, Brandon 1, Unorganized 1).

Diphtheria Carrier: Total 4—Winnipeg 2, St. Clements 2.

Trachoma: Total 1—Brokenhead 1.

Septic Sore Throat: Total 1—The Pas 1.

Venereal Disease: Total 141—Gonorrhoea 110, Syphilis 31.

DEATHS FROM ALL CAUSES IN MANITOBA
For the Month of October, 1936.

URBAN—Cancer 41, Pneumonia 15, Tuberculosis 4, Syphilis 4, Infantile Paralysis 3, Scarlet Fever 1, Typhoid Fever 1, all others under one year 3, all others 153, Stillbirths 15. Total 240.

RURAL—Cancer 19, Pneumonia 17, Tuberculosis 18, Infantile Paralysis 4, Influenza 4, Puerperal Septicaemia 3, Erysipelas 1, all others under 1 year 4, all others 190, Stillbirths 19. Total 279.

INDIAN—Tuberculosis 10, Pneumonia 7, Influenza 4, Measles 3, all others under 1 year 5, all others 17, Stillbirths 1. Total 47.

Medical Library
University of Manitoba

A summary of the contents of some of the journals available for practitioners, submitted by the Faculty of Medicine of the University of Manitoba. Compiled by T. E. HOLLAND, B.Sc., M.D. (Man.), F.R.C.S. (Edin.).

"The Journal of the American Medical Association"—November 7th, 1936.

"Tuberculosis of the Hip in Children"—by Joseph S. Barr, M.D., Boston.

A method of arthrodesis by using strips cut from the outer table of the ilium is described.

"Necrosis of Cord Structures following the Injection Treatment of Reducible Hernia"—by Stephen A. Zieman, M.D., and T. M. Larkowski, M.D., Chicago.

Operation on a case treated by injection two weeks previously, showed necrosis of the cord and parts of adjacent structures.

"The Canadian Medical Association Journal"—December, 1936.

"The Radiological Treatment of Cancer" V. Carcinoma of the Tongue—by G. E. Richards, M.D., F.R.C.P. (C.), Professor of Radiology, University of Toronto.

VI. Intra-Oral Lesions (Except the Tongue)—by G. E. Richards, M.D., F.R.C.P. (C.), Toronto.

The articles are well illustrated by photographs.

"Endometrial Hyperplasia: A Clinical Entity"—by E. Murray Blair, M.D., C.M., Vancouver.

"Haemorrhagic Encephalitis from Neoarsphenamine in Pregnancy" (Report of a case with unusual widespread Vascular Paralysis)—by Frank E. Cormia, Montreal.

"Menorrhagia and its Modern Treatment"—by Evan Shute, B.A., M.B., F.R.C.S. (C.), London, Ontario.

"On Some of the Newer Drugs"—by V. E. Henderson, Toronto.

"Streptococcus Meningitis" (With a Report of Eight Cases—Two Recoveries)—by Fred T. Cadham, M.D., Winnipeg.

"The Red Man and the White Plague"—by David A. Stewart, M.D., Ll.D., Ninette, Manitoba.

"The American Journal of Surgery"—November, 1936.

"Head Injuries"—by Samuel A. Sandler, M.D., Jersey City.

"The Clinical Journal"—December, 1936.

"Neuritis"—by W. Ritchie Russell, M.D., F.R.C.P. (Ed.).

"Fractures of the External Condyle and Capitellum of the Humerus"—by Norman Rogers, M.Ch., F.R.C.S., Liverpool.

"A Case illustrating the Symptoms and Treatment of Haemophilia"—by G. E. Frederick Sutton, M.C., M.D. (Lond.), Bristol.

"Puerperal Jaundice"—by James Grant, M.D., D.P.H., and John H. Miller, M.B., Ch.B., Ayr.

"The Canadian Public Health Journal"—November, 1936.

"Staphylococcus Toxin, Toxoid, and Antitoxin"—by C. E. Dolman, M.B., B.S., M.R.C.P., D.P.H., and J. S. Kitching, B.A., M.D., D.P.H., Connaught Laboratories, University of Toronto.

"Co-ordination of Medical Practice with Public Health in Manitoba, Saskatchewan, and Alberta"—by F. W. Jackson, M.D., D.P.H., Winnipeg.

"The Use of the Profession in Part-Time Health Activities"—by R. O. Davison, M.D., Regina.

"The Use of Medical Clinics for the People of the Provincial Department of Health" — by Malcolm R. Bow, M.D., D.P.H., Edmonton.

These articles comprise a symposium given at the meeting of the Canadian Public Health Association and allied bodies in Vancouver, June, 1936.

"The Post-Graduate Medical Journal"—November, 1936.

"Post-Operative Chest Conditions"—by James Maxwell, M.D., F.R.C.P., London.

"The Treatment of Pulmonary Suppuration including its Surgical Relief"—by George A. Mason, F.R.C.S. (Eng.), Newcastle-on-Tyne.

"The Significances of Small Traces of Blood in the Urine"—by Geoffrey E. Parker, F.R.C.S., London.

"The Practitioner"—December, 1936.

This number contains a symposium on Diseases of the Urinary Tract.

"The Treatment of Uraemia"—by D. Murray Lyon, M.D., F.R.C.P. (E.), Edinburgh.

"The Infections of the Urinary Tract"—by R. M. Handfield Jones, M.C., M.S., F.R.C.S., St. Mary's Hospital, London.

"The Diagnosis and Treatment of Urinary Lithiasis"—by J. Swift Joly, F.R.C.S., St. Peter's Hospital for Stone.

"Disorders and Diseases of the Urinary Bladder"—by J. B. MacAlpine, M.B., F.R.C.S., Manchester.

"Diseases of the Prostate"—by John Everidge, O.B.E., F.R.C.S., London.

"Diseases of the Male External Genitalia" (Other than Venereal)—by Kenneth M. Walker, F.R.C.S., London.

"Surgery of the Urinary Tract in Childhood"—by T. Twistington Higgins, M.B., F.R.C.S., Great Ormond Street.

"The Estimation of Renal Function"—by Hugh Gainsborough, M.D., F.R.C.P.

"Clinical Examination of the Urine"—by Cuthbert Dukes, M.D., M.Sc., D.P.H.